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America between the two seas. A canal via the lake of Nicaragua was projected in 1548. Other explorations were made, for this purpose, in the Isthmus of Tehauntepec and the Isthmus of Panama.—M. Alphonse Milne Edwards has recently been making investigations in the waters of the Mediterranean. During the seventy days he was so engaged the greatest depth reached by sounding and dredging was 2600 metres. The bottom was found not devoid of living beings, species of low organization being found between depths of 1068 and 2600 metres. At an average depth of 250 metres the temperature was constant at 13° Cent. This explains the small development of life in the depths of that sea, the muddy bottom and the absence of rocks being also unfavorable to germination. The report also confirms the belief that the Mediterranean is a sea of recent formation.—The English missionary Mr. Pearson has recently returned home from Uganda with a large amount of information concerning the country and the Victoria Nyanza. He has surveyed the western shore of the lake, taken many observations, and left a careful meteorological journal. He speaks highly of the general accuracy of Mr. Stanley's work and found that nearly all his latitudes were correct.—The reinforcement of laborers for Mr. Stanley, numbering 135, left Zanzibar for the Congo on October 20th. The Belgian Association has abandoned its proposed expedition to Nyangwe which was to have effected a junction with Mr. Stanley on the lower Congo.—*Petermann's Mittheilungen* for November last contains a valuable paper by Ernest Marno on the Grass Barriers of the Nile.

MICROSCOPY.¹

A HOLLOW GLASS SPHERE AS A CONDENSER FOR MICROSCOPIC ILLUMINATION.—A glass globe filled with water has long been employed by watchmakers and engravers for the purpose of condensing the light upon their work; it was also used by some of the early microscopists. Ledermüller, in his "Mikroskopische Gemüth-und-Augen-Ergözung" (Microscopic Mind-and-eye-delights) 1763, gives a representation of his lamp and condenser; the latter is a globe without foot or neck, and is supported on the top of a square brass rod by six claws, the lamp being supported in the same way, both of them sliding into square holes at the opposite ends of a brass arm fixed on a stand. In the "Micrographia," Hooke gives a figure of his microscope and accessories, amongst them is a globe condensing the light on the stage of the instrument. This form of condenser was probably used by many of the old microscopists, but it appears soon to have fallen into disuse, as it is not mentioned by Adams in his "Micrographia Illustrata," 1771, or in his "Essays on the Microscope," 1787. Possibly the opticians of the period did not care to introduce so

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simple and inexpensive a contrivance to their patrons (mine cost one and eightpence).

I had looked upon the "globe condenser" as one of the relics of the past, and not worthy of resuscitation, until a short time ago when watching an artist engraving some fine shading on wood. I was struck with the sharpness and definition of the engraved lines (about $\frac{1}{80}$ inch apart). It at once occurred to me that this kind of illumination would suit the microscope. I therefore borrowed it and tried it first with a $\frac{1}{4}$ objective (a Ross 75°) upon *Pleurosigma angulatum*, using oblique light from the mirror; the striæ came out very distinctly. I then removed the globe, and the striæ vanished and required a more oblique ray to render them again visible. I next tried it on *Synedra robusta*, and resolved the striæ into beads; this I had not been able to do before with this objective. I next tried it with low powers ($1\frac{1}{2}$ in., 1 in. and $\frac{2}{3}$ objectives). I first used the $\frac{2}{3}$, but forgot to alter the previous position of the mirror, and consequently obtained a "black field;" the object I had placed upon the stage was *Haliomma humboldtii*; I was surprised at the beautiful effect upon that form. It appeared as though illuminated by intense moonlight with a slight green tinge, and delightfully cool to the eye. I have since purchased a smaller globe (six inches in diameter) than the one I tried; the liquid with which it is filled is a dilute solution of sulphate of copper (about $\frac{1}{2}$ ounce of saturated solution to one pint of water). The mixture must be filtered if ordinary water is used, the intensity of color is, however, somewhat a matter of taste. The distance of the globe from the lamp should be about two or three inches; from the globe to the mirror about eight to twelve inches. As the height of the globe cannot be altered, the necessary adjustments must be made with

$\left\{ \begin{array}{l} C C \\ B B \\ A A \end{array} \right\}$	the lamp, <i>e. g.</i> , if the mirror is at A, the lamp flame must be at C; if at C, the flame must be at A. I have just received a letter from a friend to whom I recommended the illumination, in which he writes: "I am delighted with the black ground illumination, which is certainly softer and the definition sharper than any I have tried before. Have you tried it with polarized light? I think you would be pleased with it, there is such great softness of tint and such impenetrable blackness of field when the prisms are crossed.— <i>F. Kitton in Science Gossip.</i> "
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ARRESTATION OF INFUSORIAL LIFE.—Three years ago I brought with me to the Alps a number of flasks charged with animal and vegetable infusions. The flasks had been boiled from three to five minutes in London, and hermetically sealed during ebullition. Two years ago I had sent to me to Switzerland a batch of similar flasks containing other infusions. On my arrival here this year 120 of these flasks lay upon the shelves in my little library. Though eminently putrescible, the animal and vegetable

juices had remained as sweet and clear as when they were prepared in London. * * * I took advantage of the clear weather this year to investigate the action of solar light on the development of life in these infusions, being prompted thereto by the interesting observations brought before the Royal Society by Dr. Downs and Mr. Blunt, in 1877. The sealed ends of the flasks being broken off, they were infected in part by the water of an adjacent brook, and in part by an infusion well charged with organisms. Hung up in rows upon a board, half of the flasks of each row were securely shaded from the sun, the other half being exposed to the light. In some cases, moreover, flasks were placed in a darkened room within the house, while their companions were exposed in the sunshine outside. The clear result of these experiments, of which a considerable number is made, is that by some constituent or constituents of the solar radiation an influence is exercised inimical to the development of the lowest infusoria. Twenty-four hours usually sufficed to cause the shaded flasks to pass from clearness to turbidity, while thrice this time left the exposed ones without sensible damage to their transparency. This result is not due to mere differences of temperature between the infusions. On many occasions the temperature of the exposed flasks was far more favorable to the development of life than that of the shaded ones. The energy which in the cases here referred to prevented putrefaction was energy in the radiant form. In no case have I found the flasks sterilized by insolation, for, on removing the exposed ones from the open air to a warm kitchen, they infallibly changed from clearness to turbidity. Four-and-twenty hours were in most cases sufficient to produce this change. Life is, therefore, prevented from developing itself in the infusions as long as they are exposed to the solar light, and the paralysis thus produced enables them to pass through the night time without alteration. It is, however, a suspension, not a destruction, of the germinal power, for, as before stated, when placed in a warm room, life was invariably developed. * * * It would also be interesting to examine how far insolation may be employed in the preservation of meat from putrefaction.—*Professor Tyndall before British Association, 1881.*

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SCIENTIFIC NEWS.

— The Annual Report of the Chief Signal Officer for 1881, show that this Bureau was never in more efficient order, nor doing more to promote scientific as well as purely practical interests. For example Gen. Hazen reports that he has endeavored to bring this service into active sympathy and coöperation with the ablest scientific intellects of the country. "In this direction and in response to my request, the Natural Academy of Sciences has appointed an advisory committee of consulting specialists